FUTURE CONDITIONS WITHOUT NEW DEVELOPMENT AT THE SITE

The Study Team evaluated future conditions taking into consideration growth in background traffic and traffic generated by new and proposed developments in the study area. Background traffic and new development traffic was added to existing traffic counts to determine future traffic volumes.

BACKGROUND GROWTH

Based on historical counts, the growth rate used for background traffic was 0.5 percent per year. The Office of Planning recommended a five-year design year period for all developments in this study. Hence, all balanced traffic volumes were grown by this percentage to determine background growth in traffic volumes for five years in the future.

OTHER AREA DEVELOPMENT TRAFFIC

With the help of the Office of Planning, the Study Team identified seven developments in the study area that will contribute significantly to future traffic volumes. The various developments are shown in Figure 13. The George Washington (GW) Replacement Hospital and the International Monetary Fund (IMF) Headquarters 2 are different from the rest as they are not new developments. They are replacement units to existing facilities. Important features of these developments are:

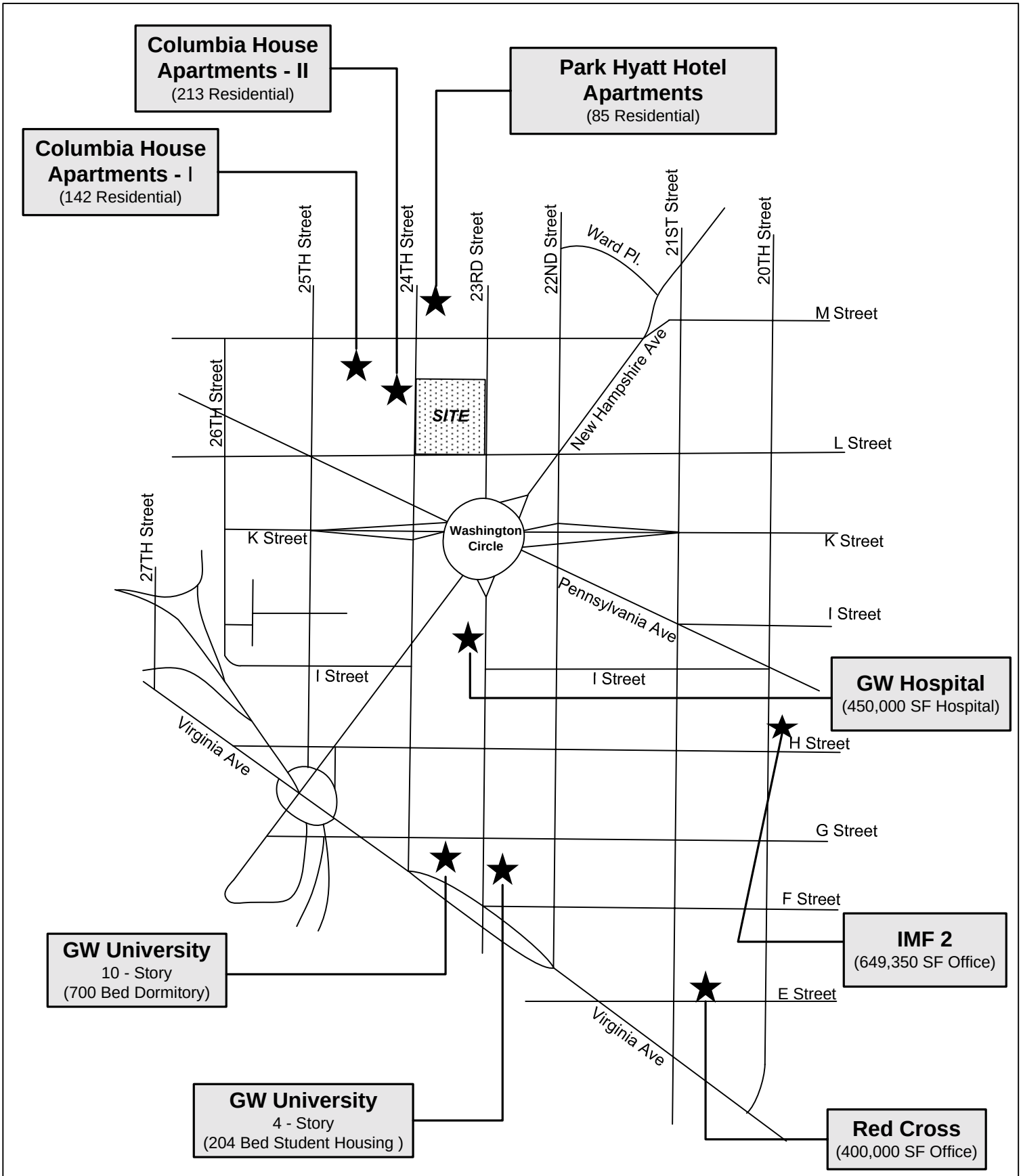
1. Columbia House Apartments – Phase I: A 142-unit residential apartment complex will be developed in the block bounded by L, M and 25th, 24th Streets.

2. Columbia House Apartments – Phase II: A 213-unit residential apartment complex will be developed in the block bounded by L, M and 25th, 24th Streets.

3. Park Hyatt Hotel Apartments: An 85-unit residential apartment complex is planned to be developed in the adjoining block of Columbia House Apartments. 24th, 23rd and M and N Streets surround this block.

4. IMF Headquarters 2: The IMF is currently headquartered in an office building situated within Square 120 in northwest Washington, D.C. bounded by 19th, 20th, G and H Streets. The proposed development is an extension, which would be developed in Square 119, immediately north of existing headquarters. PEPCO has offices at the site where the IMF extension is proposed to be located. The new building will have 649,350 square feet of office development.

5. Red Cross Headquarters: This facility is under construction within the southern section of the block bounded by 20th, 21st, E and F Streets. The development will consist of 475,000 GSF of office space, served by approximately 300 parking spaces.



Not to Scale	N	Square 37 Rezoning	Other Area Developments	FIGURE 13
September, 2002				

6. GW Replacement Hospital: The George Washington University is building a new state-of-the-art hospital to replace their existing hospital. The new building is located on land bordered by 23rd Street on the east, Washington Circle on the north, New Hampshire Avenue on the northwest, 24th Street on the southwest and by a pedestrian plaza on the south. The replacement hospital will ultimately consist of 458 beds. This hospital will act as a replacement hospital for the existing GWU hospital that is located across the street. The existing hospital will be used as an office building in the future.

7. GW Dormitory 1: A 10-story complex with 700 Beds is planned to be constructed in the block formed by G, F and 24th, 23rd Streets in northwest Washington, D.C.

8. GW Dormitory 2: A 4-story dormitory with 204 beds is planned to be developed in a contiguous block of GW Dormitory 1, which is bounded by 23rd, 22nd and F, E Streets.

Trip Generation For Other Area Development

Table 2 summarizes AM and PM peak hour, and daily traffic volume forecasts for all the other area developments. As the table indicates, office buildings and the hospital are the major traffic generators. The trip generation for the other area developments was calculated based on the available land use information and applying trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (6th Edition). The adjustment to account for transit usage was developed based on information provided in "Development Related Ridership Survey II," published by the Washington Metropolitan Area Transit Authority (WMATA)[1].

[1] Appendix E provides details on the trip generation calculations for other area developments.

Table 2
Summary Of Trip Generation For Area Development

		AM Peak Hour Trips			PM Peak Hour Trips			
No.	Development	IN	OUT	TOTAL	IN	OUT	TOTAL	Daily Trips (Two - way)
1	Columbia House Apartments - I	6	31	**37**	32	16	**48**	**500**
2	Park Hyatt Hotel Aparments	4	19	**23**	22	11	**32**	**320**
3	GW University Dormitory # 1	22	67	**90**	91	39	**130**	**1000**
4	GW University Dormitory # 2	8	24	**32**	58	25	**82**	**450**
5	Red Cross Office Building	277	38	**315**	50	245	**296**	**2160**
6	IMF Office Building	111	14	**125**	21	107	**128**	**680**
7	GW Hospital	247	40	**287**	54	224	**278**	**1490**
8	Columbia House Apartments - II	9	46	**55**	45	22	**67**	**710**
	Total Area Development Traffic	**685**	**278**	**963**	**372**	**689**	**1,061**	**7,310**

Note:

The Table *" Trip Generation For Area Development,"* included in Appendix E, presents more details on the square footage and number of units used in the calculations. It also presents detailed information on the ITE Trip Generation rates used in the calculations.

The information to estimate the trip generation for the IMF Headquarters 2 was obtained from obtained from the study "Traffic Impact Analysis – International Monetary Headquarters 2 Building, Rezoning and Planned Unit Development Application," dated May 11, 2002 and prepared by O.R. George & Associates, Inc. Table 3 summarizes the projected trips:

Table 3
IMF 2 Headquarters Trip Generation

	AM Peak Hour		**PM Peak Hour**	
	Enter	Exit	Enter	Exit
Proposed Office Building	313	43	59	288
PEPCO (Existing Building)	(202)	(29)	(38)	(219)
Net Total Trips	**111**	**14**	**21**	**107**

The George Washington University (GWU) Replacement Hospital trip generation is different from the rest of the developments. In this case, a new replacement hospital is to be built and the existing hospital would be reused as an office building. The trip generation for the GWU Hospital was derived based on information included in "George Washington University Replacement Hospital – Transportation Impact Analysis," dated November 4, 1998, prepared by Gorove/Slade Associates, Inc. Table 4 summarizes the projected trips for the GWU Hospital:

Table 4
GWU Replacement Hospital Trip Generation

	AM Peak Hour		**PM Peak Hour**	
	Enter	Exit	Enter	Exit
New Hospital	224	30	41	200
Existing Hospital (as Office Building)	183	76	103	199
Old Hospital	(170)	(66)	(90)	(174)
Net Total Trips	**247**	**40**	**54**	**224**

Trip Distributions for Other Area Developments

In the cases of the George Washington University Replacement Hospital and IMF 2 Headquarters, trips were distributed according to the information on site traffic distributions provided in their respective traffic studies. Once the boundaries of these traffic studies were reached, trips were distributed on the basis of existing traffic patterns. Trips for the other developments – Columbia House Apartments, Park Hyatt Hotel Apartments, GWU Dormitory 1 and GWU Dormitory 2 were distributed based on existing traffic patterns. Separate distributions were developed for commercial and residential developments. The detailed distributions used with the other area developments can be found in Appendix F.

Trip Assignments for Other Area Developments

The projected year 2007 background trip assignments at each of the study area intersections were estimated by combining the traffic assignments for Columbia House Apartments, Park Hyatt Hotel Apartments, GWU Dormitory 1, GWU Dormitory 2, Red Cross, IMF Headquarters 2, and George Washington University Replacement Hospital with the grown "existing" volumes. Figure 14 presents the background growth and other area development traffic volumes. Figure 15 presents the 2007 total background traffic volumes with the existing land uses for the site. Some of the intersections will experience a large increase in traffic volumes, where a few will experience a moderate increase.

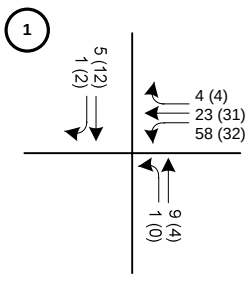
Levels of Service with Background Traffic

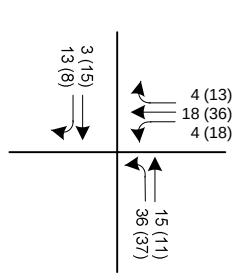
The Study Team used SYNCHRO, a traffic modeling/analysis program, to evaluate traffic conditions at critical intersections in the study area. SimTraffic, SYNCHRO's associated traffic simulation software, was used to assist in the development of a model that accurately depicts existing traffic conditions.

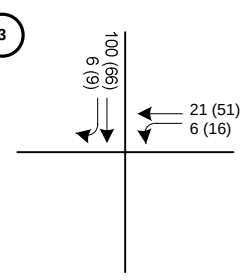
The Study Team used the SimTraffic results to calculate levels of service (LOS) and the delay per vehicle for all the critical intersections in the study area. The LOS evaluation uses a six-letter grade scale (A to F) to rank the overall traffic handling ability of an intersection or a network. LOS A indicates excellent traffic operations with minimal delays. LOS F represents failing conditions with long delays. Appendix C provides a description of the different levels of service and their associated delays for both signalized and unsignalized intersections.

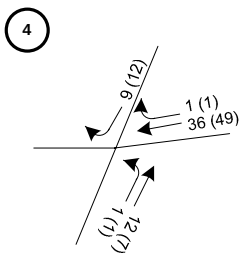
In general, due to other area developments and background growth, traffic conditions at most of the intersections degrade in the 2007 model. Counter-intuitively, some intersections get better. This happens due to the "bottleneck" effect. With the addition of traffic at some entry and exit points for the study area, these choke points are not able to serve the entire traffic flow, and hence some traffic never reaches internal intersections. Thus these points act like "bottlenecks," and since adjacent intersections are underutilized, they perform better with increased traffic volumes approaching the study area.

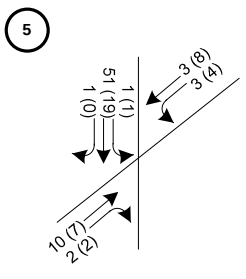
Although the delay per vehicle increased at most of the intersections, in most cases there was not enough of an increase to degrade the LOS. Table 5 compares the levels of service for existing traffic conditions and for future background and other area development traffic during the AM and PM peak hours, both with and without all proposed improvements. In general, levels of service are currently worse, and will remain worse, during the PM peak hour than during the AM peak hour.

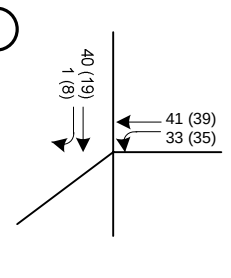


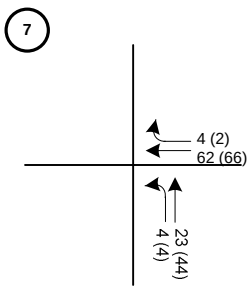


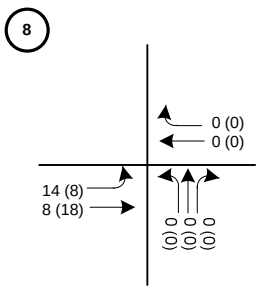


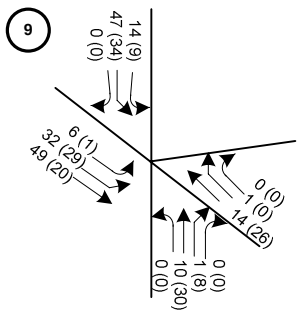


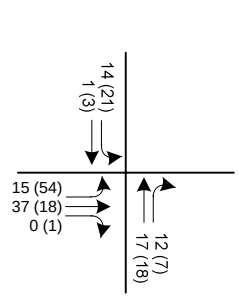


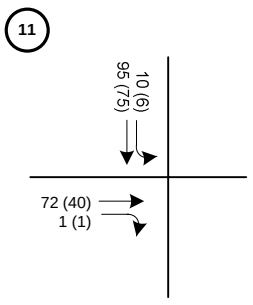


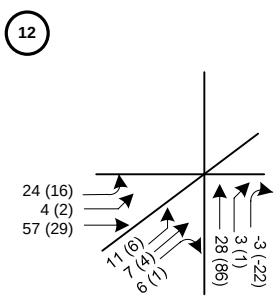


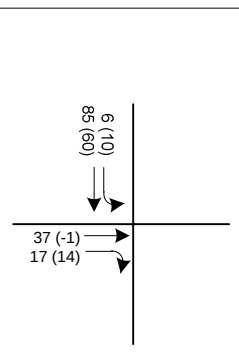


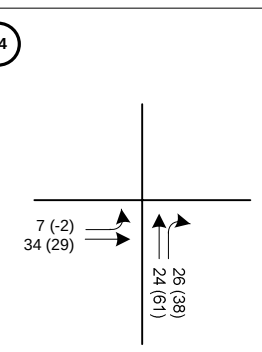


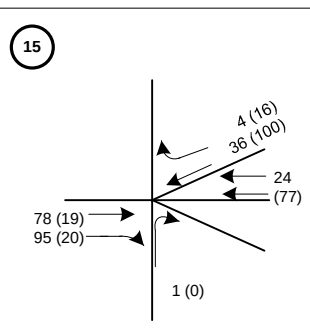


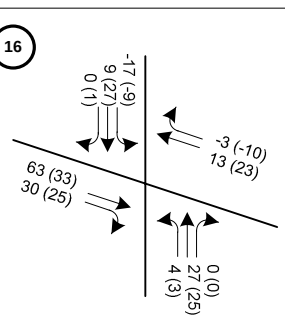


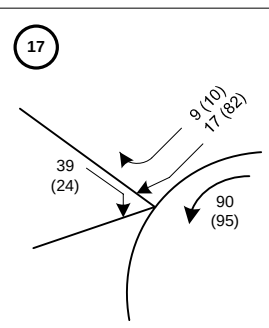


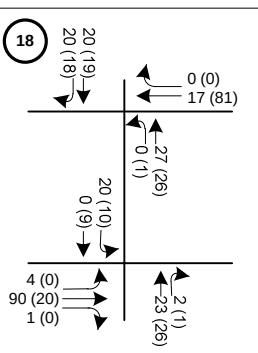


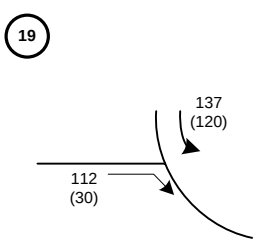


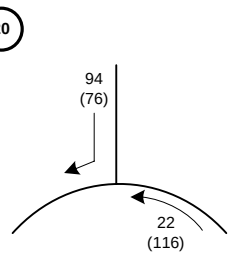


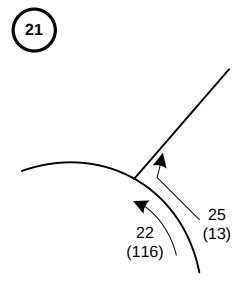


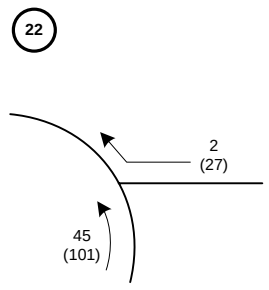


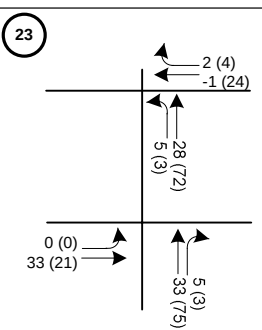


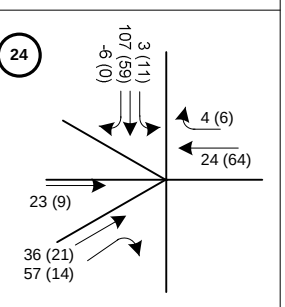


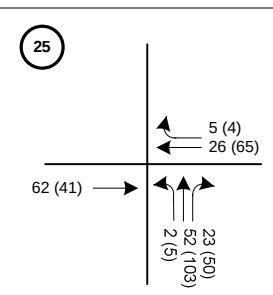


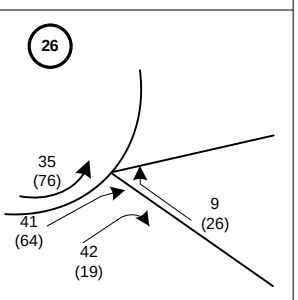


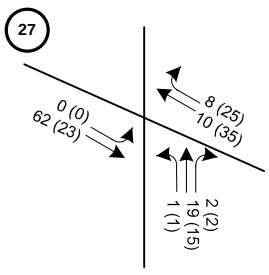


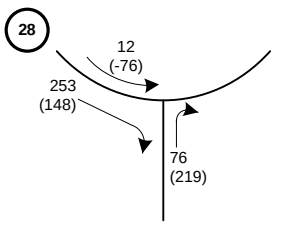


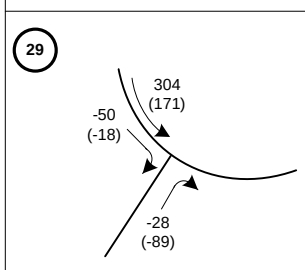


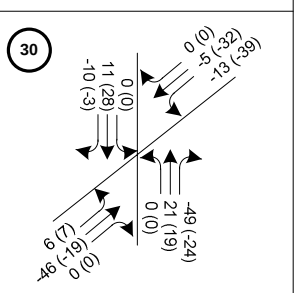


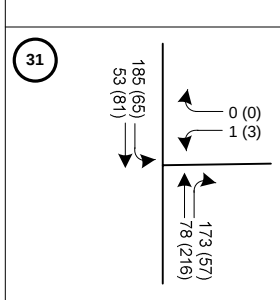


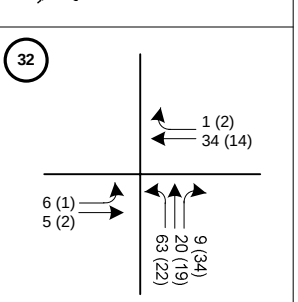


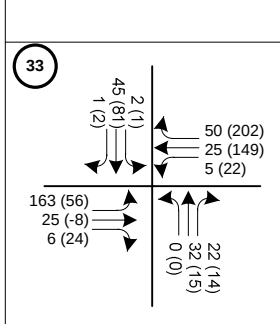


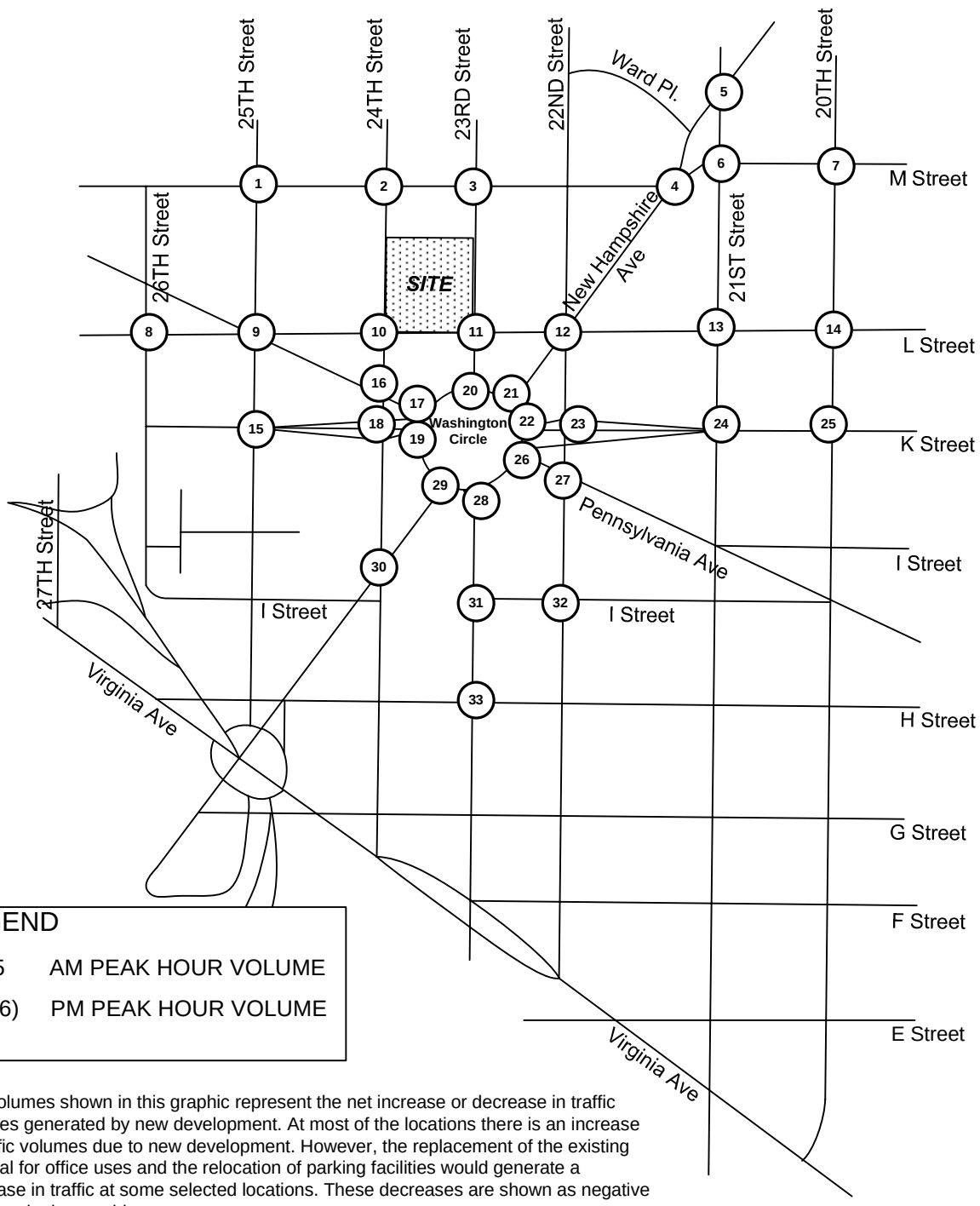












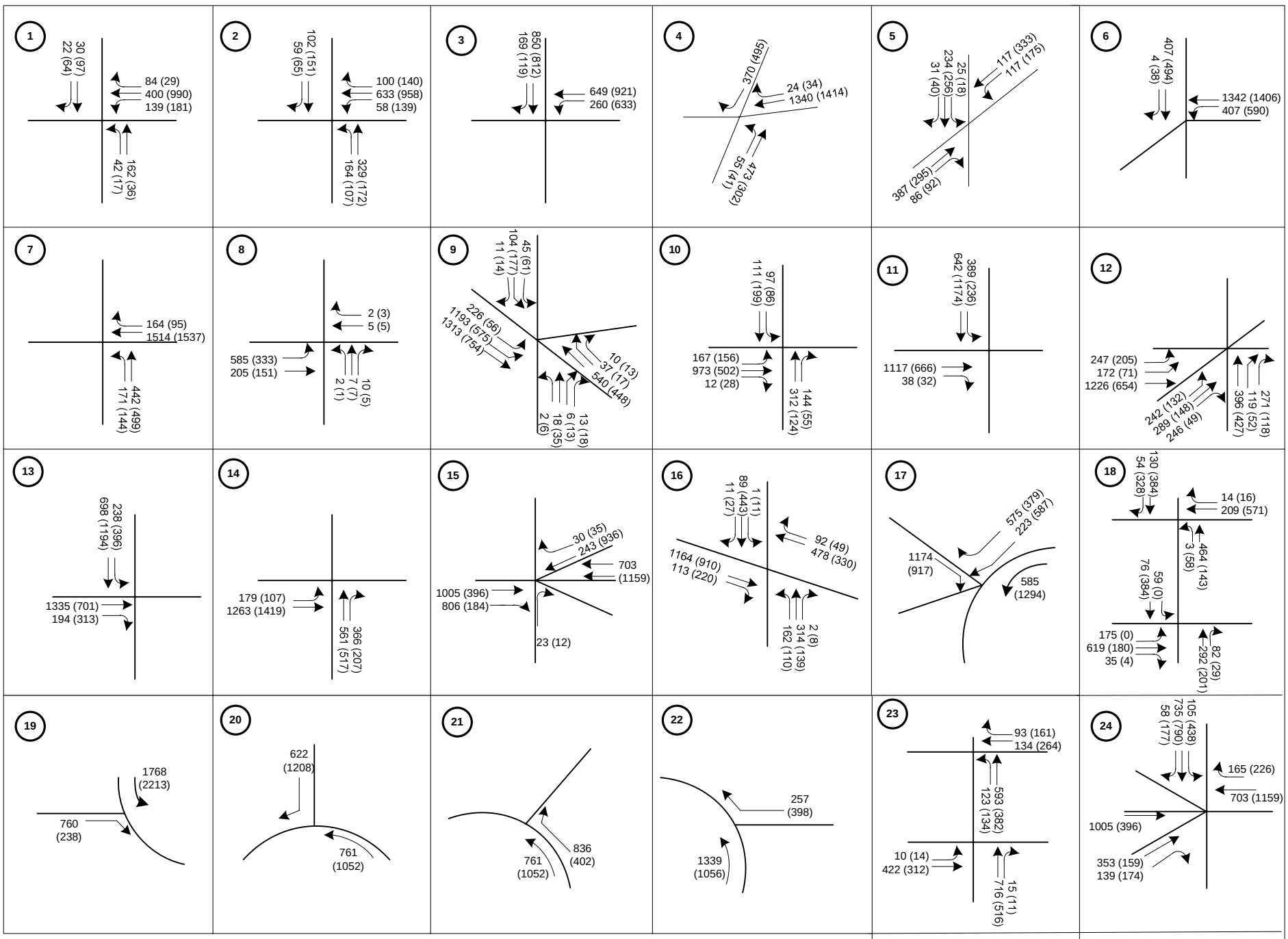
LEGEND

385 AM PEAK HOUR VOLUME

(456) PM PEAK HOUR VOLUME

Note:
The volumes shown in this graphic represent the net increase or decrease in traffic volumes generated by new development. At most of the locations there is an increase in traffic volumes due to new development. However, the replacement of the existing hospital for office uses and the relocation of parking facilities would generate a decrease in traffic at some selected locations. These decreases are shown as negative numbers in the graphic.

Not to Scale September, 2002	N	**Square 37 Rezoning**	**2007 AM and PM Peak Hour Volumes For Area Developments and Background Growth**	**FIGURE 14**



Not to Scale September, 2002	N	**Square 37 Rezoning**	**2007 AM and PM Peak Hour Volumes with Area Developments, Background Growth and Existing Site Land Uses**	**FIGURE 15**

Table 5

Level of Service Comparison
Existing Conditions and 2007 Background and Other Area Development Conditions

		AM Existing Peak Hour		AM 2007 Peak Hour		PM Existing Peak Hour		PM 2007 Peak Hour	
		No Improvements	All Improvements	No Improvements	All Improvements	No Improvements	All Improvements	No Improvements	All Improvements
	Intersection	LOS	LOS			LOS	LOS		
1	25th Street and M Street	A	A	A	A	**F**	**A**	C	**F**
2	24th Street and M Street	A	B	A	A	**F**	**E**	**F**	**F**
3	23rd Street and M Street	A	**A**	**F**	A	**F**	**F**	**F**	**F**
4	M Street and New Hampshire Avenue	A	B	B	A	**F**	**F**	**F**	**F**
5	21st Street and New Hampshire Avenue	C	B	C	B	**F**	**F**	**F**	**F**
6	21st Street and M Street	B	B	B	B	**F**	**F**	**F**	**F**
7	20th Street and M Street	B	**B**	B	B	**F**	**F**	**F**	**F**
8	26th Street and L Street	B	B	B	B	A	A	A	A
9	25th Street / L Street / Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**
10	24th Street and L Street	B	D	B	B	**F**	**F**	**F**	**F**
11	23rd Street and L Street	B	**A**	**F**	B	**F**	**F**	**F**	**F**
12	L Street and New Hampshire Avenue	**F**	**F**	D	D	B	**F**	B	**E**
13	21st Street and L Street	B	B	B	B	C	B	B	C
14	20th Street and L Street	B	B	B	B	B	B	C	B
15	25th Street and K Street	**E**	**F**	**F**	**F**	C	C	C	C
16	24th Street and Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**
17	K Street Service Road and Washington Circle (NW)	C	**C**	D	C	C	C	C	C
18a	24th Street and K Street (N)	B	C	B	B	C	D	B	B
18b	24th Street and K Street (S)	**E**	**F**	**F**	**F**	B	D	D	D
19	K Street Service Road and Washington Circle (SW)	A	A	B	A	A	A	A	A
20	23rd Street and Washington Circle (N)	B	B	D	C	A	D	B	**E**
21	New Hampshire Avenue and Washington Circle (NE)	A	A	A	C	A	C	A	D
22	K Street Service Road and Washington Circle (NE)	A	A	A	A	A	A	A	A
23a	22nd Street and K Street (N)	C	C	B	B	B	B	C	C
23b	22nd Street and K Street (S)	B	B	B	B	A	A	A	A
24	21st Street and K Street	C	C	C	D	C	C	C	C
25	20th Street and K Street	B	B	B	B	B	B	B	B
26	Pennslyvania Avenue and Washington Circle (SE)	B	A	B	B	B	B	C	C
27	22nd Street and Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**
28	23rd Street and Washington Circle (S)	A	A	B	A	A	A	A	A
29	New Hampshire Avenue and Washington Circle (SW)	B	B	D	C	B	A	B	A
30	24th Street and New Hampshire Avenue	**F**	**F**	**F**	**F**	**F**	B	**F**	B
31	23rd Street and I Street	B	C	C	C	B	B	B	B
32	22nd Street and I Street	D	**E**	A	A	A	A	A	A
33	23rd Street and H Street	A	C	B	C	A	A	**F**	**F**

Note: The level of service for some of the intersections deteriorates under the scenario with improvements. This is due to the effect of additional traffic reaching internal intersections as a result of improved capacity at intersections that are currently metering the traffic at entry locations to the study area. While some of the intersections are expected to degrade due to the implementation of the proposed improvements, many intersections are expected to operate at much better LOS than today. Furthermore, the traffic model indicates that the overall delay for the study area network will be lower with the implementation of the proposed improvements during the AM and PM peak hours.

Improvements to Mitigate Other Area Development Impacts

Improvements will be needed to address the impacts of the other area developments. These improvements, however, were included as part of the comprehensive list of improvements developed to address existing issues and deficiencies. The measures proposed to address existing conditions will provide additional capacity to mitigate some of the effects of the new development in the Study Area. Major regional improvements, such as construction of interchanges and regional bridge widenings would be required to provide the necessary infrastructure to accommodate the traffic traversing the area and allow all intersections to operate at acceptable levels of service.